

Brute™ Elite Volume Water Heaters

Indoor 150,000 - 850,000 BTU/Hr.
Up to 97% Thermal Efficiency



The unit will be designed and constructed in accordance with the ASME Boiler and Pressure Vessel Code Section IV requirements for 160 psi working pressure. The units will bear the ASME "H" stamp and be registered by the National Board.



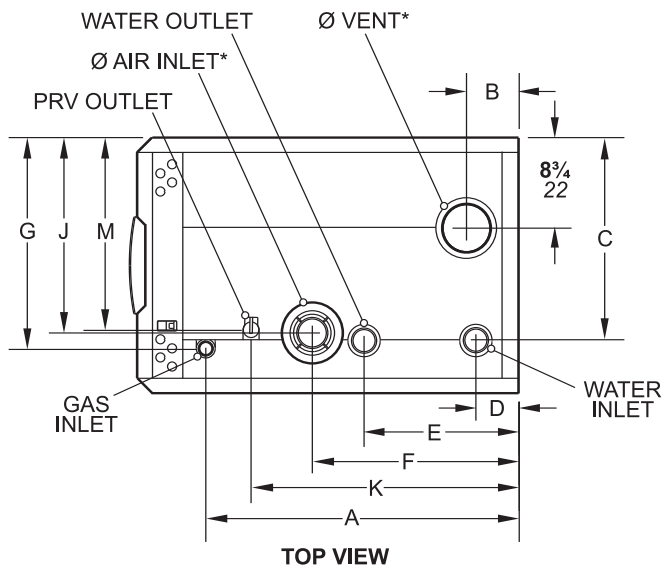
5-Year Limited Heat Exchanger Warranty / 1-Year Limited Warranty on Component Parts.

For more information on warranty, please visit www.bradfordwhite.com

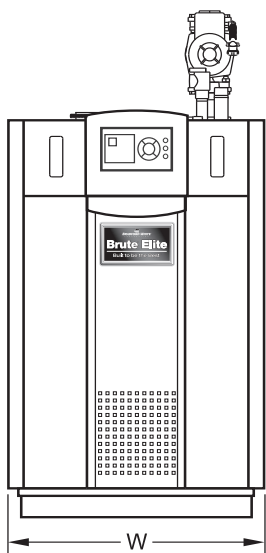
For products installed in USA, Canada and Puerto Rico. Some states do not allow limitations on warranties. See complete copy of the warranty included with the heater.

MANUFACTURED UNDER ONE OR MORE OF THE FOLLOWING U.S. PATENTS: 5,682,666; 7,634,976; 5,660,165; 5,954,492; 6,056,542; 6,935,280; 5,372,185; 5,485,879; 5,574,822; 7,971,560; 7,992,526; 6,684,821; 6,442,178; 7,334,419; 7,866,168; 7,270,087; 7,007,748; 5,596,952; 6,142,216; 7,699,026; 5,341,770; 7,337,517; 7,665,211; 7,665,210; 7,063,132; 7,063,133; 7,559,293; 7,900,589; 5,943,984; 8,082,888; 5,988,117; 7,621,238; 7,650,859; 5,761,379; 7,409,925; 5,277,171; 8,146,772; 7,458,341; 2,262,174. OTHER U.S. AND FOREIGN PATENT APPLICATIONS PENDING. CURRENT CANADIAN PATENTS: 2,314,845; 2,504,824; 2,108,186; 2,143,031; 2,409,271; 2,548,958; 2,112,515; 2,476,685; 2,239,007; 2,092,105; 2,107,012.

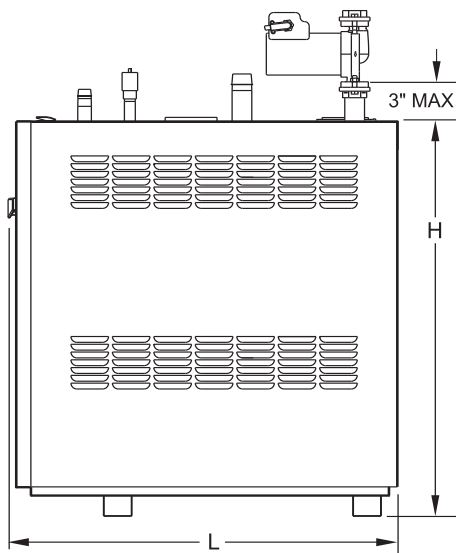
Brute™ Elite Volume Water Heater Specifications - Sizes 150-500



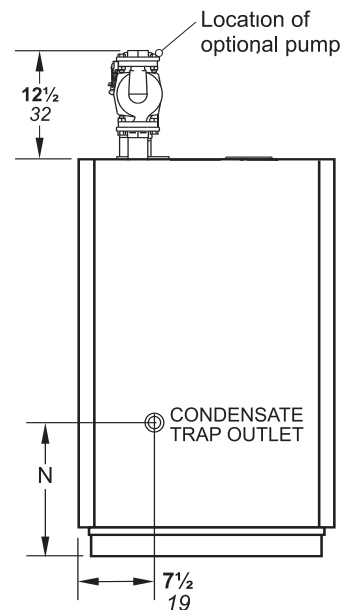
Dimensions shown in **inches cm**



FRONT VIEW



RIGHT SIDE VIEW



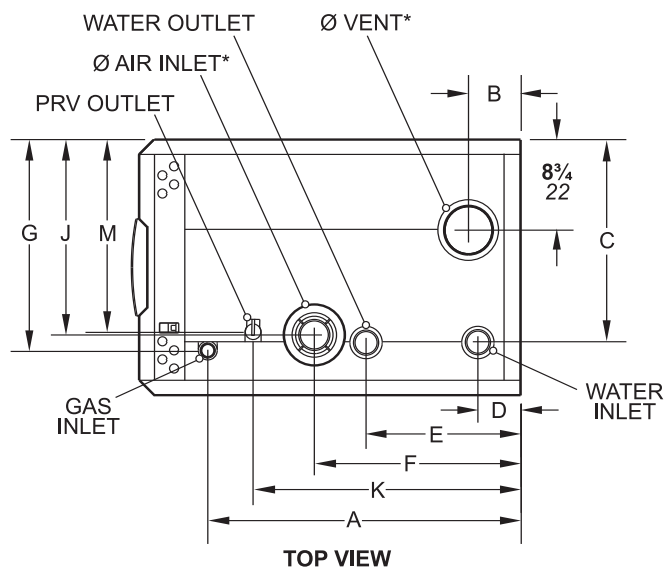
BACK VIEW

Dimensions

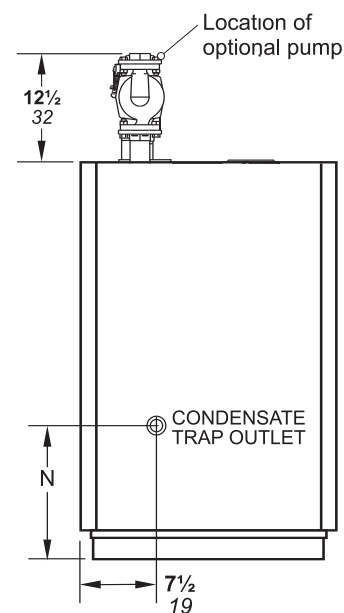
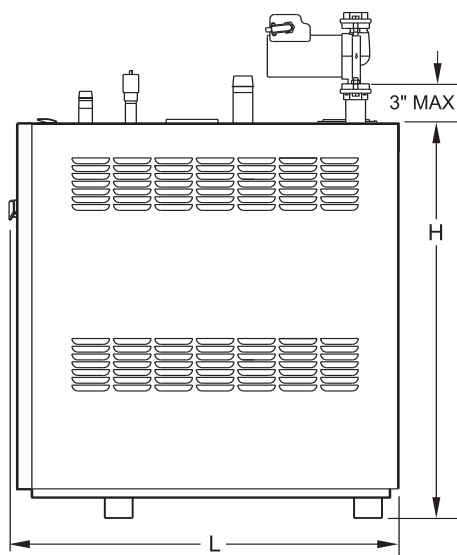
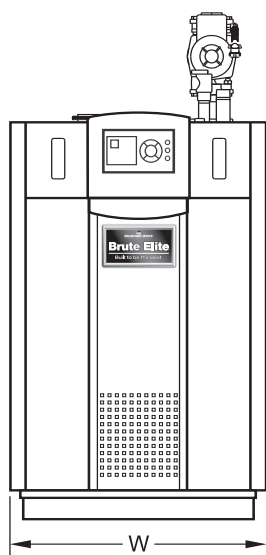
Model Number	A	B	C	D	E	F	G	J	K	M	N	W	L	H	Air Inlet Conn. in.*	Vent Conn. in.*	Connections NPT Size	
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.			Water in.	Gas in.
BNTV-150	13 ¹ / ₄	5 ¹ / ₄	19	3 ¹ / ₄	10 ³ / ₄	7 ¹ / ₂	14 ¹ / ₄	19 ¹ / ₂	7 ¹ / ₂	15 ¹ / ₄	13	25	19 ¹ / ₂	38 ¹ / ₄	3	3	1 ¹ / ₄	1 ¹ / ₂
BNTV-199	20 ¹ / ₂	5 ¹ / ₄	19	3 ¹ / ₄	17 ³ / ₄	7 ¹ / ₂	14 ¹ / ₄	19 ¹ / ₂	11 ³ / ₄	15 ¹ / ₄	13	25	26 ³ / ₄	38 ¹ / ₄	3	3	1 ¹ / ₄	1 ¹ / ₂
BNTV-285	20 ¹ / ₄	7 ¹ / ₄	19 ³ / ₄	4 ¹ / ₄	11 ¹ / ₄	13 ¹ / ₂	14	15	17	18 ³ / ₄	13	25	26 ³ / ₄	38 ¹ / ₄	4 ¹ / ₂	4 ¹ / ₂	2	3 ⁴ / ₄
BNTV-399	25	5 ¹ / ₄	19 ³ / ₄	4 ¹ / ₄	14 ³ / ₄	18 ¹ / ₂	19 ¹ / ₄	16 ¹ / ₂	21 ³ / ₄	18 ³ / ₄	13	25	31 ¹ / ₂	38 ¹ / ₄	4 ¹ / ₂	4 ¹ / ₂	2	3 ⁴ / ₄
BNTV-500	30 ¹ / ₄	5 ¹ / ₄	19 ³ / ₄	4 ¹ / ₄	15 ¹ / ₄	20	20 ¹ / ₂	19	26	18 ³ / ₄	13	25	37 ³ / ₄	38 ¹ / ₄	4 ¹ / ₂	4 ¹ / ₂	2	1
Model Number	A	B	C	D	E	F	G	J	K	M	N	W	L	H	Air Inlet Conn. cm*	Vent Conn. cm*	Connections NPT Size	
	cm	cm	cm	cm	cm	cm	cm	cm	cm	cm	cm	cm	cm	cm			Water cm	Gas cm
BNTV-150	34	14	48	8	28	19	36	49	19	39	33	64	49	97	7.6	7.6	3.2	3.2
BNTV-199	52	14	48	8	45	19	36	49	30	39	33	64	68	97	7.6	7.6	3.2	3.2
BNTV-285	52	19	50	16	29	34	36	38	43	48	33	64	68	97	11	11	5.1	5.1
BNTV-399	64	13	50	11	37	47	49	42	55	48	33	64	80	97	11	11	5.1	5.1
BNTV-500	77	13	50	11	38	51	52	48	66	48	33	64	96	97	11	11	5.1	5.1

*Brute Elite is shipped with adapters for the air and vent that accept standard pipe of the proper size and type.

Brute™ Elite Volume Water Heater Specifications - Sizes 600-850



Dimensions shown in inches cm



Dimensions

Model Number	A	B	C	D	E	F	G	J	K	M	N	W	L	H	Air Inlet Conn. in.*	Vent Conn. in.*	Connections NPT Size Water in.	Gas in.
BNTV-600	29 3/4	5	19 1/2	4 1/4	15	20	3	19	26	18 3/4	8 1/4	25	37 3/4	38 1/4	4 1/2	4 1/2	2	1
BNTV-750	35 1/2	6	19 1/2	5 1/4	19	40 1/2	3 1/4	19	30 3/4	18 3/4	8 1/4	25	51	38 1/4	4 1/2	6 1/2	2	1 1/2
BNTV-850	39 3/4	6	19 1/2	5 1/4	19	44 3/4	3 1/2	19	35	18 3/4	8 1/4	25	55 1/4	38 1/4	4 1/2	6 1/2	2	1 1/2

Model Number	A	B	C	D	E	F	G	J	K	M	N	W	L	H	Air Inlet Conn. cm*	Vent Conn. cm*	Connections NPT Size Water cm	Gas cm
BNTV-600	76	13	50	11	38	51	8	48	66	48	21	64	96	97	11	11	5.1	2.5
BNTV-750	90	15	50	13	48	103	8	48	78	48	21	64	130	97	11	17	5.1	3.8
BNTV-850	101	15	50	13	48	114	9	48	79	48	21	64	130	97	11	17	5.1	3.8

*Brute Elite is shipped with adapters for the air and vent that accept standard pipe of the proper size and type.

Brute™ Elite Volume Water Heater Specifications

Sizing Data

Model Number	Input		Output		Thermal Efficiency	Shipping Weight	
	BTU/Hr.	kW	BTU/Hr.	kW	%	lbs.	kg.
BNTV-150	150,000	44.0	142,500	41.8	95.0	220	100
BNTV-199	199,000	58.3	193,030	56.6	97.0	245	111
BNTV-285	285,000	83.5	270,750	79.4	95.0	350	159
BNTV-399	399,000	116.9	383,040	112.3	96.0	410	186
BNTV-500	500,000	146.5	480,000	140.7	96.0	480	218
BNTV-600	600,000	175.8	582,000	170.6	97.0	394	179
BNTV-750	750,000	219.8	705,000	206.6	94.0	469	213
BNTV-850	850,000	249.1	816,000	239.2	96.0	502	228

Clearances

Appliance Surface	Suggested Service Access Clearance	
	in.	cm.
Left Side	1	2.5
Right Side	12	31
Top	24	61
Back	6	15
Closet, Front (285-500)	6	15
Alcove, Front (285-500)	24	61
Front (600-850)	24	61
Vent	—	—

Certified by CSA for zero clearance to combustible materials on all sides.

Vent System

Max. Equivalent* Vent Length PVC/CPVC (each intake and each exhaust)

Model Number	Air Intake Dia. in.	Air Intake Dia. cm	Ex. Vent Dia. in.	Ex. Vent Dia. cm	Max. Allowable Length
BNTV-150	3	7.6	3	7.6	100 ft. 30 m.
BNTV-199	3	7.6	3	7.6	100 ft. 30 m.
BNTV-285	3	7.6	3	7.6	20 ft. 6.1 m.
	4	10.1	4	10.1	100 ft. 30 m.
BNTV-399	4	10.1	4	10.1	100 ft. 30 m.
BNTV-500	4	10.1	4	10.1	100 ft. 30 m.
BNTV-600	4	10.1	4	10.1	40 ft. 12 m.
	6**	15.2**	6**	15.2**	100 ft.** 30 m.**
BNTV-750	4	10.1	4	10.1	40 ft. 12 m.
	6	15.2	6	15.2	100 ft. 30 m.
BNTV-850	4	10.1	4	10.1	40 ft. 12 m.
	6	15.2	6	15.2	100 ft. 30 m.

Intake (air) pipe may be ABS, PVC, CPVC or galvanized material.

** Allowed only if the vent pipe is no more than 20 equivalent feet longer than the air pipe.

Installations in the U.S. require exhaust vent pipe that is a combination of PVC & CPVC complying with ANSI/ASTM D1785 F441, polypropylene pipe that conforms with ULC S636, or stainless steel complying with UL1738. Installations in Canada require exhaust vent pipe that is certified to ULCS636.

Installer must comply fully with manufacturer's installation instructions, including use of minimum exhaust length CPVC, to maintain ANSI Z21.13 safety certification.

Closet and alcove installations do not allow the use of PVC under any circumstances

*To calculate max equivalent length, measure the linear feet of the pipe, and add 5 feet (1.5m) for each elbow used.

Electrical Data

Models	Boiler (Includes Pump)		
	Volts	Phase	Amps
150-500 (No Pump)	120	Single	2*
150-199 (With Pump)	120	Single	7*
285-500 (With Pump)	120	Single	8*

* Minimum 15A circuit required.

600-850 pump not included.

Water Flow Requirements

Model Number	Normal Water*					
	Flow GPM	H/L Ft.	Temp. Rise °F	Flow LPM	H/L m	Temp. Rise °C
BNTV-150	19.0	57.0	15.0	72.0	17.4	8.0
BNTV-199	25.0	28.0	15.0	95.0	8.5	8.0
BNTV-285	36.0	33.0	15.0	98.0	10.1	8.0
BNTV-399	50.0	35.0	15.0	189.0	10.7	8.0
BNTV-500	63.0	28.0	15.0	239.0	8.5	8.0
BNTV-600	60.0	24.0	19.0	227.0	7.3	11.0
BNTV-750	68.0	35.0	21.0	257.0	10.7	12.0
BNTV-850	68.0	26.0	24.0	257.0	7.9	13.0

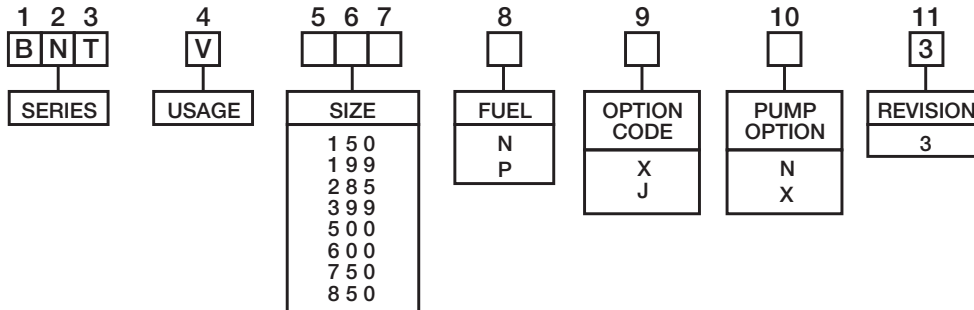
* Maximum water hardness of 10 grains per gallon allowed.

Recovery Data

Model Number	Required Water Temperature Rise							
	40°F GPH	50°F GPH	60°F GPH	70°F GPH	80°F GPH	90°F GPH	100°F GPH	140°F GPH
BNTV-150	432	346	288	247	216	192	173	144
BNTV-199	585	486	390	334	293	260	234	195
BNTV-285	821	656	547	469	410	365	328	274
BNTV-399	1161	929	774	663	580	516	464	387
BNTV-500	1455	1164	970	832	727	647	582	485
BNTV-600	1764	1411	1176	1008	882	784	706	588
BNTV-750	2136	1709	1424	1221	1068	950	855	712
BNTV-850	2473	1978	1649	1413	1236	1099	989	824

Model Number	Required Water Temperature Rise								
	22°C L/h	28°C L/h	33°C L/h	39°C L/h	44°C L/h	50°C L/h	56°C L/h	67°C L/h	76°C L/h
BNTV-150	1635	1310	1090	935	818	727	655	545	466
BNTV-199	2214	1840	1476	1264	1109	984	886	738	632
BNTV-285	3108	2483	2071	1775	1552	1382	1242	1037	886
BNTV-399	4395	3517	2930	2510	2196	1953	1756	1465	1257
BNTV-500	5508	4406	3672	3149	2752	2449	2203	1836	1575
BNTV-600	6677	5341	4452	3816	3339	2968	2673	2226	1908
BNTV-750	8086	6469	5390	4622	4043	3596	3237	2695	2309
BNTV-850	9361	7488	6242	5349	4679	4160	3744	3119	2676

Brute™ Elite Volume Water Heater Specifications



Model Character Designation

(1-3) Model Series Designation

BNT = Brute Elite

(4) Usage

V = Volume Water

(5-7) Size

150 = 150,000 BTU/Hr. Input
199 = 199,000 BTU/Hr. Input
285 = 285,000 BTU/Hr. Input
399 = 399,000 BTU/Hr. Input
500 = 500,000 BTU/Hr. Input
600 = 600,000 BTU/Hr. Input
750 = 750,000 BTU/Hr. Input
850 = 850,000 BTU/Hr. Input

(8) Fuel

N = Natural Gas
P = Propane

(9) Options

X = None
J = CSD-1, FM, GAP, IL (500-850 only))

(10) Pump Options

N = Normal Pump (150-500 only)
X = No Pump

(11) Revision

3 = Third Revision

Standard Features

- Large LCD display with touchpad user-interface
- Menus for login, display setup, quick start, advanced setup, test and diagnostics
- Password-protected parameters for installer use
- Customizable homescreen and LCD contrast
- Quick start feature for simple, single heater installations
- Test feature allows forced min or max firing
- Complete diagnostics for analog and digital inputs
- Displays holds, alerts and errors in clear text form
- Dry alarm contacts for ignition failure
- High condensing efficiency
- Modulation down to 20% of full fire (5:1 turndown)
- Sealed combustion chamber
- Pre-mix stainless steel burner
- Low NOx system exceeds the most stringent regulations for air quality - less than 10ppm NOx
- Horizontal or vertical direct vent
- Horizontal vent and air terminals
- Vent and air pipe lengths of up to 100 equivalent feet (each)
- Built-in condensate trap
- Vent temperature cutoff feature
- Direct spark ignition system
- Sensor for domestic water tank
- 160 psi maximum working pressure
- Stainless steel heat exchanger with welded construction (no gaskets)
- ASME "H" stamp
- 125 psi (861 kPa) ASME rated pressure relief valve
- Water flow switch (399-850 only)
- Temperature & pressure gauge
- Cascades with other NeoTherms
- Drain valve
- Integrated PID temperature and ignition controls
- Electronic PID modulating control
- Alarm output
- Accepts external (4-20mA or 0-10V) modulation signal
- On/off toggle switch
- Manual reset high limit
- Burner site glass
- Zero clearance to combustible surfaces
- Built-in cascade function for up to eight Brute™ Elites
- 5 year limited warranty

Factory Mounted Options

- CSD-1, FM, GAP, IL code equipment (500-850) - includes LWCO (low water cutoff), high and low pressure switches
- LWCO (500-850)
- Additional auto reset high limit
- High and low gas pressure switches (500-850)
- Alarm bell w/silence switch for ignition failure
- 60 PSI pressure relief valve
- 75 PSI pressure relief valve
- 150 PSI pressure relief valve

Accessories for Field Mounting

- Water flow switch (150-285)
- LWCO
- High and low gas pressure switches
- Propane conversion kit
- Condensate neutralizer kit
- BACnet gateway
- LON gateway
- 2" PVC Concentric Vent Terminal (150-199)
- 3" PVC Concentric Vent Terminal (150-285)
- 3" PVC Flush Mount Terminal (150-285) (side wall only)
- 4" PVC Flush Mount Terminal (285-850) (side wall only)

Brute™ Elite Volume Water Heater Specifications

Sample Specification

The heater shall be a Bradford White Model BNTV _____, rated at the input and output shown on the schedule. The heater shall modulate 20-100% of full fire. The unit(s) shall be design-certified to comply with the current edition of the Harmonized ANSI Z21.13 / CSA 4.3 Standard for Gas-Fired Low Pressure Steam and Gas Water Heaters. The unit(s) shall be designed and constructed in accordance with the ASME Boiler & Pressure Vessel Code, Section IV requirements for 160 psi (1103 kPa) maximum working pressure, and shall bear the ASME "H" Stamp and be listed by the National Board. The unit(s) shall be constructed to comply with the efficiency requirements of the latest edition of ASHRAE Standard 90.1. The heater shall be equipped with an ASME certified relief valve set at 125 psi (861 kPa).

The water tube heat exchanger shall be stainless steel, rated at 160 psi (1103 kPa) working pressure. The heat exchanger shall be a low water volume design, welded construction, with no gaskets, o-rings or bolts in the header. Heat exchanger shall be accessible for visual inspection and cleaning of all internal surfaces. The heater shall be fully condensing design with built-in condensate drain and tap. The heat exchanger shall have a limited five-year warranty.

Each heater shall be fully test fired, (with water, gas, and venting connected), and all safety components tested, at the factory.

150-500 models shall be shipped with a pump and a conduit. The wiring and terminals shall be wired to the pump. The heater shall have a flanged inlet water connection that allows the pump to be connected directly to the top of the heater in the field. The pump shall be capable of serving the heaters's heat exchanger and 30 feet (9m) of piping that is the same size as the heater's water connections, with a normal amount of pipe fittings.

The heater shall use a premix burner with a stainless steel woven metal fiber wrap, and a negative pressure gas valve to burn cleanly, with NOx emissions not exceeding 10ppm. The heater shall meet the emissions requirements of SCAQMD 2012.

The heater shall be designed for the vertical or horizontal Category IV venting, up to 100 equivalent feet (30m) with a PVC, CPVC, polypropylene that complies with ULC S636, or stainless steel vent material. Air may be taken from the room, or ducted directly to the heater, using up to 100 equivalent feet (30m) ABS, PVC, CPVC. The heater shall be shipped with PVC sidewall vent and air terminals, for use with horizontal systems. The first section of CPVC vent pipe shall be shipped with each heater.

Dimensions and specifications subject to change without notice in accordance with our policy of continuous product improvement.



Ambler, PA

For U.S. and Canada field service, contact your professional installer or local Bradford White sales representative.

Sales 800-523-2931 • Fax 215-641-1670 / Technical Support 800-334-3393 • Fax 269-795-1089 • Warranty 800-531-2111 • Fax 269-795-1089

International: Telephone 215-641-9400 • Telefax 215-641-9750 / www.bradfordwhite.com

 **BRADFORD WHITE-CANADA™ INC.** Sales / Technical Support 866-690-0961 / 905-238-0100 • Fax 905-238-0105 / www.bradfordwhite.com

Built to be the Best™

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